

REMARKS/ARGUMENTS

Claims 1-4 are currently pending in this application.

Claims 1-4 stand finally rejected under § 102 as being anticipated by United States Patent 5,872,820 ("Upadrasta"). (It is assumed that Upadstrat was intended where Oksala is mentioned in rejecting claims 2-4.) This rejection is respectfully traversed.

The pending claims are directed to the use of a Connect Frame Number (CFN) to implement timing adjustments, i.e. adjustments in when wireless signals are sent by a transmitter. For example, the adjustment of "uplink transmission timing" recited in claim 1 relates to when transmissions are made by the Mobile Station (MS). The teachings of Upadrasta have nothing to do with any adjustments to when a MS makes a transmission.

The system timeframes are divided into timeslots. Conventionally, some timeslots are used for downlink transmissions (TXs) and others are used for uplink TXs. For any given time frame, a MS essentially listens during the timeslots used for downlink TXs to receive what a base station (BS) has transmitted in those timeslots. The MS than may transmit in the uplink TX slots during which periods the BS is listening.

As explained in the present application, modern communications are processed at such high speeds that the time it takes for wireless signals to travel between BSs and MSs becomes significant. If a first time slot TS1 is used for

downlink TX and a second next timeslot TS2 is used for uplink TX, after a base station transmits in a TS1 of a timeframe, it will immediately listen for MS transmissions in the TS2 of that timeframe. However, in order for the MS transmission to reach the BS at the start of TS2 (from the BS's perspective), the MS must transmit at a time before the start of TS2 relative to the BS. How much in advance is dependent upon how long it takes the signals to travel which will vary as the MS moves from one location to another and in some cases due to atmospheric or other conditions.

As explained in Upadrasta, both BSs and MSs conventionally track timeframes based on consecutive number designations. For a given communication between a MS and a BS, the first timeframe of the communication may be designated in the BS as #15, but in the MS may be designated as #6 even though it is the same timeframe. Accordingly, the BS transmission in TS1 of timeframe #15 is received in TS1 of the MS's timeframe #6 and the transmission of the MS in TS2 of its timeframe #6 is received in TS2 of the BS's timeframe #15.

If there is no adjustment of the timeframe numbering from either BS or MS perspective, the difference in the respective reference numbering of the timeframes will remain the constant. In the above example, this means that the BS transmission in TS1 of timeframe #16 is received in TS1 of the MS's timeframe #7 and the transmission of the MS in TS2 of its timeframe #7 is received in TS2 of the BS's timeframe #16; the BS transmission in TS1 of timeframe #17 is received in

TS1 of the MS's timeframe #8 and the transmission of the MS in TS2 of its timeframe #8 is received in TS2 of the BS's timeframe #17...etc.

Upadrasta is directed to synchronizing the timeframe reference numbering between a mobile unit and a base station. As stated in the Summary of Upadrasta:

The invention provides a method and apparatus for **synchronization of frame numbers** between a base station sub-system and a mobile station. ... The amount of time lag is added to the mobile frame number counter of the mobile station **so that the mobile frame number counter is synchronized** with the base station sub-system.
(Bold Emphasis added)

In the above example, the BS would signal in its TS1 transmission of its timeframe #15 that the BS refers to that time frame as #15. That BS transmission is received by the MS in TS1 of the MS's timeframe #6. Upadrasta then calculates the difference between the MS reference number 15 and its reference number 6 to come up with what it refers to as the "time lag", in this case 9. Accordingly, instead of the MS referring to the next timeframe as #7, it adds 9 to the count so that the next time frame becomes #16, thereby matching the time frame reference numbering being used by the BS.

Whether or not these numbers are synchronized, the MS continues to make its transmissions in TS2, i.e. the uplink TX timeslot. The relative time when the MS makes its transmissions in TS2 of a timeframe is not changed simply by changing the MS's reference number for the time frame, i.e. there is no uplink timing adjustment taught by Upadrasta.

Once the respective counters in Upadrasta are proceeding with the same numbers, the Upadrasta process is finished. There is nothing disclosed in Upadrasta about adjusting when the MS transmits in, for example, a TS2 so that it is received without any time delay by the BS.

The present claims are directed to instructing the MS exactly when to make timing adjustments. For the above example, the BS in TS1 of its timeframe#15 may transmit data specifying that a timing adjustment is desired and that the MS should make the adjustment starting in the BS's timeframe #18 (In this case 18 or the relative equivalent number +3 would be the connect frame number - CFN.). The BS2 will then expect the MS transmission it receives in TS2 of its timeframe #18 to be an adjusted transmission; the BS will also know that the transmissions received in TS2 of the BS's timeframes #15, #16 and #17 have not been adjusted. This is important because the BS then does not have to guess which timeframe the MS actually started transmitting with adjusted timing. Thus the BS is then able to reliably make further measurements to determine if the received signal needs further timing adjustment.

On the MS side of the above example, the MS receives the adjustment instruction in TS1 of its timeframe #6 to make the timing adjustment starting in the BS's timeframe #18. If the teachings of Upadrasta are employed, the next timeframe for the MS will not be designated #7, but will be designated by the MS as

#16 to match the BS numbering. In such case the timing adjustment will be made per the CFN in the MS's TS2 transmission in the MS's timeframe #18.

Matching of the respective timeframe numbering as taught by Upstata is not essential to using the claimed invention. If the MS does not change its numbering, the example BS instruction transmitted in the BS's timeframe #15 to make a timing adjustment in relative CFN +3 will be received in TS1 of the MS's timeframe #6. The MS will then change the timing of its TS2 transmissions starting in the MS's timeframe#9 which is the BS's timeframe #18, so that, as the BS expects, the BS will start receiving the adjusted MS transmissions in TS2 of its timeframe #18.

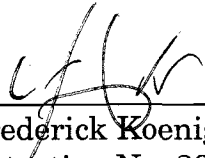
Upadrasta does not address transmission timing adjustments. There is no teaching of retarding or advancing when MS transmissions are made with respect to a timeslot of a timeframe. Accordingly, claims 1-4 are not anticipated by and patentably define over Upadrasta.

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In view of the foregoing remarks, Applicant respectfully submits that the present application, including claims 1-4, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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